



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,094	09/26/2003	Jeffrey S. Lille	HIT1P035/HSJ9-2003-0154US	7094
50535	7590	06/28/2006	EXAMINER	
ZILKA-KOTAB, PC P.O. BOX 721120 SAN JOSE, CA 95172-1120			RENNER, CRAIG A	
			ART UNIT	PAPER NUMBER
			2627	

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/672,094

Applicant(s)

LILLE, JEFFREY S.

Examiner

Craig A. Renner

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 21-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-20 and 32 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 26 September 2003.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of "Group I, claims 1-20 and 32" in the reply filed on 12 April 2006 is acknowledged. Accordingly, claims 21-31 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to one or more non-elected inventions/species, there being no allowable generic or linking claim.

Information Disclosure Statement

2. Items M-T in the information disclosure statement filed 26 September 2003 fail to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. The information disclosure statement has been placed in the application file, but the information pertaining to items M-T referred to therein has not been considered.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "wherein the trailing shield is magnetically continuous to a back gap of the magnetic head" as per claims 6 and 17 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) and/or an amendment to the claims in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. FIGS. 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

6. The disclosure is objected to because of the following informalities:

- a. In line 18 of claim 12, "non-magneitc" should be spelled --non-magnetic--.
- b. In line 2 of claim 16, "the magnetic head" should be changed to --the magnetic head structure-- in order to more clearly refer back to that set forth in line 1 of independent claim 12.
- c. In line 1 of claim 18, "the return pole" should be changed to --the return pole piece-- in order to more clearly refer back to that set forth in line 17 of independent claim 12.
- d. In line 5 of claim 32, "the medium" should be changed to --the media-- in order to more clearly refer back to that set forth in line 2 of claim 32.
- e. In line 8 of claim 32, "magnetic media" should be changed to --the magnetic media-- in order to refer back to that set forth in line 2 of claim 32.
- f. In lines 9, 12 and 15 of claim 32, each instance of "the pole" should be changed to --the pole tip-- in order to refer back to that set forth in line 8 of claim 32.

- g. In line 16 of claim 32, "sheild" should be spelled --shield--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 6 and 12-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. In lines 1-2 of claim 6, it is indefinite as to how the trailing shield can be "magnetically continuous to a back gap of the magnetic head" when it has been previously defined that "a non-magnetic mask layer co-planar to the trailing shield... defines the height of the trailing shield." That is, the height of the trailing shield is limited by the mask layer and therefore never extends far enough to be magnetically continuous to the back gap of the magnetic head.

b. In lines 10-11 of claim 12, "a shaping layer positioned between the probe pole piece and the insulation stack" is indefinite as it is misdescriptive of the disclosure, which teaches/shows a shaping layer **824** positioned between a probe pole piece **826** and a first pole piece **816**.

c. In lines 13 and 16 of claim 12, each instance of "the pole" is indefinite because it lacks clear and/or positive antecedent basis.

d. In lines 1-2 of claim 17, it is indefinite as to how the trailing shield can be "magnetically continuous to a back gap of the magnetic head structure" when it has been previously defined that "a non-magnetic mask layer... is co-planar to the trailing shield." That is, the trailing shield is limited by the coplanar mask layer and therefore never extends far enough to be magnetically continuous to the back gap of the magnetic head structure.

e. Claims 13-20 inherit the indefiniteness associated with independent claim 12 and stand rejected as well.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1, 3, 5-7, 9-11 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Cole et al. (US 5,452,164).

With respect to claims 1, 3, 5-7 and 9-11, Cole teaches a magnetic head (52) having an air bearing surface (ABS), comprising a writing pole (includes P1) comprising a pole tip (PT1b); a shaping layer (PT1a) coupled to the pole tip; a trailing shield (PT2b) spaced apart from the writing pole; and a non-magnetic mask layer (I_1) co-planar to the trailing shield which defines the height of the trailing shield (as shown in FIG. 5, for instance) [as per claim 1]. wherein a distance (G) is between the pole tip and the trailing shield [as per claim 3]; wherein the trailing shield is not magnetically continuous to a back gap of the magnetic head (as shown in FIG. 5, for instance) [as per claim 5]; wherein the trailing shield is magnetically continuous to a back gap of the magnetic head (as shown in FIG. 5, for instance, i.e., in so far as this limitation is definite and understood as detailed in paragraph 8a, supra) [as per claim 6]; wherein the magnetic head further comprises a return pole (P2), the trailing shield being positioned between the writing pole and the return pole (as shown in FIG. 5, for instance) [as per claim 7]; wherein the head is a perpendicular head (as shown in FIG. 1, for instance, i.e., the head is oriented perpendicular to a magnetic recording medium) [as per claim 9]; wherein the trailing shield is positioned adjacent a mask material (I_1) defining a throat height of the trailing shield (as shown in FIG. 5, for instance) [as per claim 10]; and wherein a height of the mask material is greater than a distance from the trailing shield to the air bearing surface (as shown in FIG. 5, for instance) [as per claim 11]. With respect to the intended use limitations appearing throughout these claims and in particular claim 3, note that a recitation with respect to the manner in which a claimed apparatus (i.e., "magnetic head") is intended to be employed (i.e., at "a distance

between the ABS end of the pole tip and a writeable layer of the media", for instance (emphasis added)) does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations, *Ex parte Masham*, 2 USPQ2d 1647 (PTO BPAI 1987).

With respect to claim 32, Cole teaches a magnetic storage system comprising magnetic media (44); at least one head (52) having a write head portion including a pole tip (PT1b); a shaping layer (PT1a) coupled to the pole tip; and a trailing shield (PT2b) spaced apart from the pole tip; a non-magnetic mask layer (I_1) which is coplanar to the trailing shield (as shown in FIG. 5, for instance); a slider (48); and a control unit (includes 59, for instance) coupled to the head.

11. Claims 1, 3, 5-12, 14, and 16-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Stoev et al. (US 6,724,572).

With respect to claims 1, 3 and 5-11, Stoev teaches a magnetic head (102) having an air bearing surface (33), comprising a writing pole (includes 108) comprising a pole tip (64); a shaping layer (110) coupled to the pole tip; a trailing shield (68) spaced apart from the writing pole; and a non-magnetic mask layer (45, for instance) co-planar to the trailing shield which defines the height of the trailing shield (as shown in FIG. 3, for instance) [as per claim 1]. wherein a distance is between the pole tip and the trailing shield (as shown in FIG. 3, for instance) [as per claim 3]; wherein the trailing shield is not magnetically continuous to a back gap (60) of the magnetic head (as shown in FIG. 3, for instance) [as per claim 5]; wherein the trailing shield is magnetically continuous to

a back gap (60) of the magnetic head (as shown in FIG. 3, for instance, i.e., in so far as this limitation is definite and understood as detailed in paragraph 8a, supra) [as per claim 6]; wherein the magnetic head further comprises a return pole (72), the trailing shield being positioned between the writing pole and the return pole (as shown in FIG. 3, for instance) [as per claim 7]; wherein the return pole is stitched to the trailing shield at a position (74) recessed from the air bearing surface (as shown in FIG. 3, for instance) [as per claim 8]; wherein the head is a perpendicular head (as shown in FIG. 3, for instance, i.e., the head is oriented perpendicular) [as per claim 9]; wherein the trailing shield is positioned adjacent a mask material (45) defining a throat height of the trailing shield (as shown in FIG. 3, for instance) [as per claim 10]; and wherein a height of the mask material is greater than a distance from the trailing shield to the air bearing surface (as shown in FIG. 3, for instance) [as per claim 11]. With respect to the intended use limitations appearing throughout these claims and in particular claim 3, note that a recitation with respect to the manner in which a claimed apparatus (i.e., "magnetic head") is intended to be employed (i.e., at "a distance between the ABS end of the pole tip and a writeable layer of the media", for instance (emphasis added)) does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. See *Ex parte Masham*, supra.

With respect to claims 12, 14 and 16-20, Stoev teaches a magnetic head structure (102) having an air bearing surface (33), comprising a write head portion including a first pole piece (108) having a first pole tip (114); a probe pole piece (64) having a probe pole tip (i.e., at the air bearing surface); an insulation stack (45)

Art Unit: 2627

positioned between the pole pieces; at least one write coil (55) embedded in the insulation stack; a shaping layer (110) positioned between the probe pole piece and the first pole piece (as shown in FIG. 3, for instance); a trailing shield (68) spaced apart from the pole; a return pole piece (72); and a non-magnetic mask layer (118, for instance) which is coplanar to the trailing shield (as shown in FIG. 3, for instance) [as per claim 12]; wherein a distance is between the probe pole tip and the trailing shield (as shown in FIG. 3, for instance) [as per claim 14]; wherein the trailing shield is not magnetically continuous to a back gap (60) of the magnetic head (as shown in FIG. 3, for instance) [as per claim 16]; wherein the trailing shield is magnetically continuous to a back gap (60) of the magnetic head structure (as shown in FIG. 3, for instance, i.e., in so far as this limitation is definite and understood as detailed in paragraph 8d, supra) [as per claim 17]; wherein the return pole is stitched to the trailing shield at a position (74) recessed from the air bearing surface (as shown in FIG. 3, for instance) [as per claim 18]; wherein the trailing shield is positioned adjacent a mask material (includes 45, for instance) defining a throat height of the trailing shield (as shown in FIG. 3, for instance) [as per claim 19]; and wherein a height of the mask material is greater than a distance from the trailing shield to the air bearing surface (as shown in FIG. 3, for instance) [as per claim 20]. With respect to the intended use limitations appearing throughout these claims and in particular claim 14, note that a recitation with respect to the manner in which a claimed apparatus (i.e., "magnetic head structure") is intended to be employed (i.e., at "a distance between the ABS end of the pole tip and a writeable layer of the media", for instance (emphasis added)) does not differentiate the claimed

apparatus from a prior art apparatus satisfying the claimed structural limitations. See *Ex parte Masham*, supra.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cole et al. (US 5,452,164).

Cole teaches the magnetic head/magnetic head structure as detailed in paragraph 10, supra. Cole, however, remains silent as to the distance being "less than about 50 nm."

Official notice is taken of the fact that it is notoriously old and well known in the magnetic head art to modify the parameters of magnetic head components during the course of routine optimization/experimentation. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had the distance being less than about 50 nm in Cole. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had the distance being less than about 50 nm in Cole since such a range, absent any criticality (i.e., unobvious and/or unexpected result(s)), is generally achievable through routine

Art Unit: 2627

optimization/experimentation, and since discovering the optimum or workable ranges, where the general conditions of a claim are disclosed in the prior art, involves only routine skill in the art, *In re Aller*, 105 USPQ 233 (CCPA 1955). Moreover, in the absence of any criticality (i.e., unobvious and/or unexpected result(s)), the parameter set forth above would have been obvious to a person having ordinary skill in the art at the time the invention was made, *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

14. Claims 4 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stoev et al. (US 6,724,572).

Stoev teaches the magnetic head/magnetic head structure as detailed in paragraph 11, *supra*. Stoev, however, remains silent as to the distance being "less than about 50 nm."

Official notice is taken of the fact that it is notoriously old and well known in the magnetic head art to modify the parameters of magnetic head components during the course of routine optimization/experimentation. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have had the distance being less than about 50 nm in Stoev. The rationale is as follows:

One of ordinary skill in the art would have been motivated to have had the distance being less than about 50 nm in Stoev since such a range, absent any criticality (i.e., unobvious and/or unexpected result(s)), is generally achievable through routine optimization/experimentation, and since discovering the optimum or workable ranges,

Art Unit: 2627

where the general conditions of a claim are disclosed in the prior art, involves only routine skill in the art, *In re Aller*, 105 USPQ 233 (CCPA 1955). Moreover, in the absence of any criticality (i.e., unobvious and/or unexpected result(s)), the parameter set forth above would have been obvious to a person having ordinary skill in the art at the time the invention was made, *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

Pertinent Prior Art

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. This includes Chen et al. (US 5,652,687), Shouji et al. (US 5,831,801), Yoda et al. (US 5,872,693), Shi (US 6,055,138), Dill, Jr. et al. (US 6,226,149), Sasaki (US 6,388,845), Crue et al. (US 6,594,112), Kobayashi et al. (US 2002/0044379), Sasaki (US 2002/0057526), and Ohtomo et al. (US 2003/0048581), which each individually teaches a magnetic head with a non-magnetic mask layer coplanar with a trailing shield.

Allowable Subject Matter


16. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Craig A. Renner whose telephone number is (571) 272-7580. The examiner can normally be reached on Tuesday-Friday 9:00 AM - 7:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T. Nguyen can be reached on (571) 272-7579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


Craig A. Renner
Primary Examiner
Art Unit 2627

CAR